WE CLAIM:

1. In a telecommunication system for transporting a telecommunication signal comprising signal overhead and payload between a multitude of sites, a method of propagating to a second site signal degrade (SD) information related to a signal received at a first site, the method comprising steps of:

sampling the signal received for SD indicia over a sampling period to determine SD information at the first site;

encoding, at the first site, a SD message indicating either the SD information as sampled or a synchronization code; and

mapping, at the first site, the SD message into a timeslot of signal overhead, for transport to the second site;

wherein the sampling period is selected to provide SD information passthrough in accordance with predetermined performance monitoring criteria.

2. The method as claimed in claim 1 further comprising steps of:

monitoring, at the second site, the timeslot of signal overhead in the signal received for a change in a value of the SD message; and

if the value has changed, decoding the SD message to determine the SD information.

3. The method as claimed in claim 2 further comprising a step of:

generating a SD condition corresponding to the decoded SD information in signal overhead of a signal transported to another site in the telecommunications system.

4. The method as claimed in claim 1 wherein the signal degrade indicia are bit errors.

5. The method as claimed in claim 4 wherein the step of encoding comprises the step of:

encoding the SD message with a value indicative of an exact bit error count if a count of bit errors on the trib signal for the sampling period is less than a threshold value and, otherwise, encoding the SD message with a value indicative of an approximation of the error count.

6. The method as claimed in claim 2 wherein the signal degrade indicia are bit errors.

7. The method as claimed in claim 2 wherein the step of encoding comprises a step of:

encoding the SD message with a value indicative of an exact bit error count if a count of bit errors on

the trib signal for the sampling period is less than a threshold value and, otherwise, encoding the SD message with a value indicative of an approximation of the error count.

8. The method as claimed in claim 1 wherein the step of encoding comprises encoding the SD message with the SD information for mapping for a first portion of a next sampling period and encoding the SD message with a synchronization code indicating no SD information for mapping for a remainder of the next sampling period.

9. The method as claimed in claim 2 wherein the step of encoding comprises encoding the SD message with the SD information for mapping for a first portion of a next sampling period and encoding the SD message with a synchronization code indicating no SD information for mapping for transporting for the remainder of the next sampling period.

10. The method as claimed in claim 1 wherein said first and second sites each comprise a transparent multiplexer/demultiplexer (T-Mux) for transparently transporting a plurality (K) of said telecommunication signals between said first and second sites over a high-rate span, each of said K signals travelling on a corresponding tributary (trib) telecommunication system and wherein each of the steps are respectively performed for each of the corresponding K signals.

11. The method as claimed in claim 2 wherein said first and second sites each comprise a transparent multiplexer/demultiplexer (T-Mux) for transparently transporting a plurality (K) of said telecommunication signals between said first and second sites over a high-rate span, each of said K signals travelling on a corresponding tributary (trib) telecommunication system and wherein each of the steps are respectively performed for each of the corresponding K signals.

12. A method of propagating a bit error rate (BER) for each trib signal received from a plurality (K) of trib systems for transporting trib signals between a multitude of sites, all trib systems having in common a first and second site, the trib signals being multiplexed onto a supercarrier signal carried between said first and second sites over a high-rate span with no change in the provisioning of any of said trib systems, the method comprising performing at the first site steps of:

sampling each trib signal received for any bit errors over a predetermined sampling period to determine SD information for each signal;

encoding a SD message (Msg_K) for each signal indicating either SD information or a synchronization code; and

mapping Msg_K into a timeslot of signal overhead for transporting to the second site;

wherein the predetermined sampling period is selected to provide SD information passthrough in accordance with predetermined performance monitoring criteria.

13. The method as claimed in claim 12 wherein the step of encoding comprises encoding Msg_K with the SD information for mapping for a first portion of a next sampling period and encoding Msg_K with a synchronization code indicating no SD information for mapping for a remainder of the next sampling period.

14. The method as claimed in claim 12 wherein the step of encoding comprises steps of, for each of the K trib signals:

encoding Msg_K with a value indicative of an exact error count if a count of bit errors on the trib signal for the sampling period is less than a threshold value; and otherwise,

encoding Msg_K with a value indicative of an approximation of the error count.

15. The method as claimed in claim 12 further comprising performing at said second site steps of:

monitoring each respective Msg_K mapped into the supercarrier signal received from said first site for a change in value; and, if the value has changed,

decoding Msg_K to determine the SD information for each trib signal.

16. The method as claimed in claim 15 further comprising further performing at the second site a step of:

generating bit errors corresponding to the decoded SD information in respective trib signal overhead of a trib signal transported back into the respective trib telecommunication system.

17. The method as claimed in claim 12 wherein the supercarrier signal comprises trib signal operation, administration, maintenance and provisioning (OAM&P) information and supercarrier OAM&P information, and the step of mapping comprises mapping Msg_K into a timeslot of trib signal OAM&P information.

18. The method as claimed in claim 12 wherein each of the K trib signals is a SONET OC-N signal.

19. The method as claimed in claim 18 wherein the step of sampling comprises processing BIP-8 bytes from each trib signal OAM&P information for providing a trib bit error count for each trib signal as SD information.

20. The method as claimed in claim 12 wherein the sampling period is 100 milliseconds.

21. The method as claimed in claim 12 wherein the supercarrier signal is a SONET OC-N signal having a capacity sufficient to carry said K trib signals when multiplexed, said supercarrier signal comprising a supercarrier synchronous payload envelope (SPE) and a

supercarrier overhead (OH) and wherein the step of mapping comprises mapping each said Msg_K into a respective reserved timeslot of the supercarrier overhead.

22. In a transparent multiplexer/demultiplexer for transparently transporting a plurality (K) of trib signals between a first and second site over a high-rate span, the trib signals comprising forward trib signals multiplexed onto a forward supercarrier signal for transmission and reverse trib signals demultiplexed from a reverse super carrier signal upon reception, a system of propagating signal degrade (SD) information of each trib signal comprising:

means for sampling each of the forward trib signals for counting any bit errors over a sampling period to determine SD information;

means for encoding a SD message (Msg_K) indicating either SD information or a synchronization code; and

means for mapping Msg_K into a timeslot of signal overhead of the forward supercarrier signal for transport to the second site;

wherein the sampling period is selected to provide SD information passthrough in accordance with predetermined performance monitoring criteria.

23. The system as claimed in claim 22 wherein the means for encoding comprises means for coding Msg_K with

the SD information for mapping for transporting for a first portion of the next sampling period and means for coding Msg_K with a synchronization code indicating no SD information for mapping for transporting for the remainder of the next sampling period.

24. The system as claimed in claim 22 wherein the means for encoding comprises, for each of the K trib signals:

means for encoding Msg_K with a value indicative of an exact error count if a count of bit errors on the trib signal for the sampling period is less than a threshold value; and otherwise,

means for encoding Msg_K with a value indicative of an approximation of the error count.

25. The system as claimed in claim 22, further comprising, at said second site:

means for monitoring each respective Msg_K mapped into the supercarrier signal received from said first site for a change in value; and,

means for decoding Msg_K to determine the SD information for each trib signal when the change in value is detected.

26. The system as claimed in claim 25 further comprising, at the second site:

means for generating bit errors corresponding to the decoded SD information in respective trib signal overhead of a trib signal transported back into the respective trib telecommunication system.

27. The system as claimed in claim 22 wherein the supercarrier signal comprises trib signal operation, administration, maintenance and provisioning (OAM&P) information and supercarrier OAM&P information, and the means for mapping comprises means for mapping Msg_K into a timeslot of trib signal OAM&P information.

28. The system as claimed in claim 22 wherein each of the K trib signals is a SONET OC-N signal.

29. The system as claimed in claim 28 wherein the means for sampling comprises means for processing BIP-8 bytes from each trib signal OAM&P information for providing a trib bit error count for each trib signal as SD information.

30. The system as claimed in claim 22 wherein the sampling period is 100 milliseconds.

31. The system as claimed in claim 22 wherein the supercarrier signal is a SONET OC-N signal having a capacity sufficient to carry said K trib signals when multiplexed, said supercarrier signal comprising a supercarrier synchronous payload envelope (SPE) and a supercarrier overhead (OH) and wherein means for mapping comprises means for mapping each said Msg_K into a

respective reserved timeslot of the supercarrier overhead.